

برمجة التطبيقات الاسلامكية

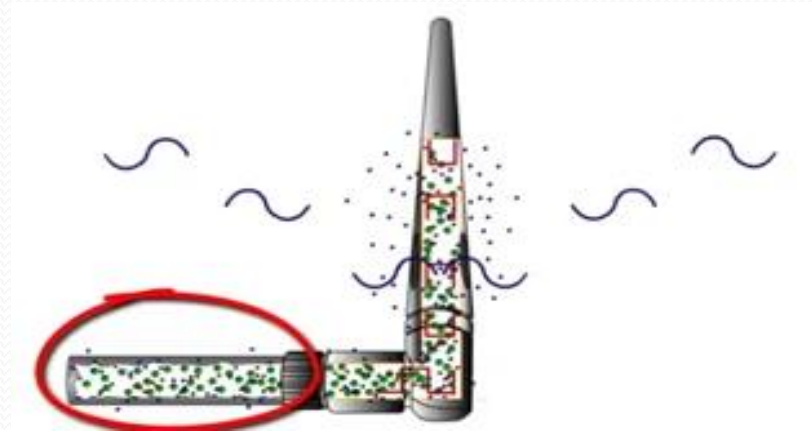
Lecture 1

By

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Introduction

- ❖ Information in Cable is an Electric signal .
- ❖ Each Electrical signal has frequency.
- ❖ Antenna converts electric power into radio waves and vice versa.



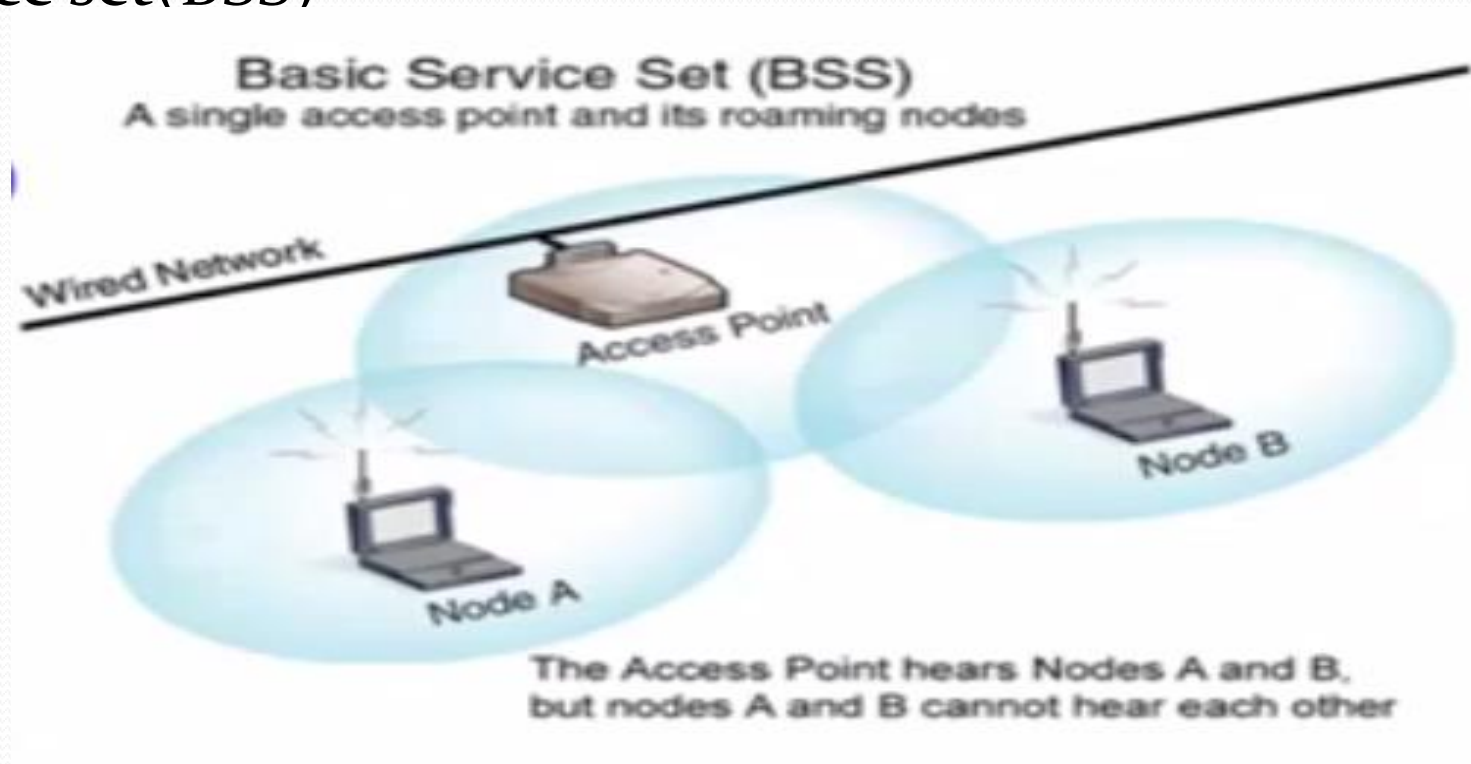
Wlan topology:

- Independent Basic Service Set (IBSS)



Wlan topology:

- Basic service set(BSS)

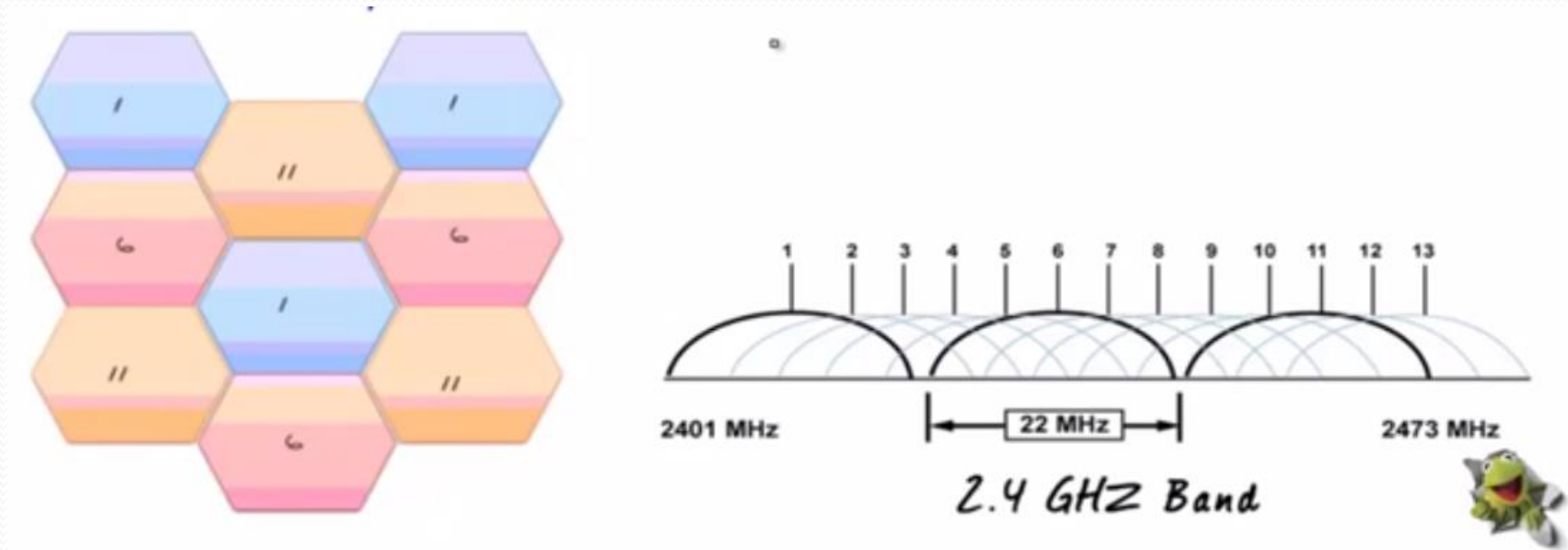


Wlan topology:

- Service set Identifier(SSID)
- Basic service set Identifier(BSSID)

Wlan channels

- Frequency Bands.
- Unlicensed frequencies.



How Station connecting to a WLAN

When a mobile station moves into the coverage area of a WLAN, the following procedures take place:

- 1) **Scanning**: the station searches for a suitable channel over which subsequent communication
- 2) **Association**: the station associates with an AP
- 3) **IP address allocation**: the station gets an IP address, for instance from a DHCP server
- 4) **Authentication**: only if this security option is required.



Discovering Service Set

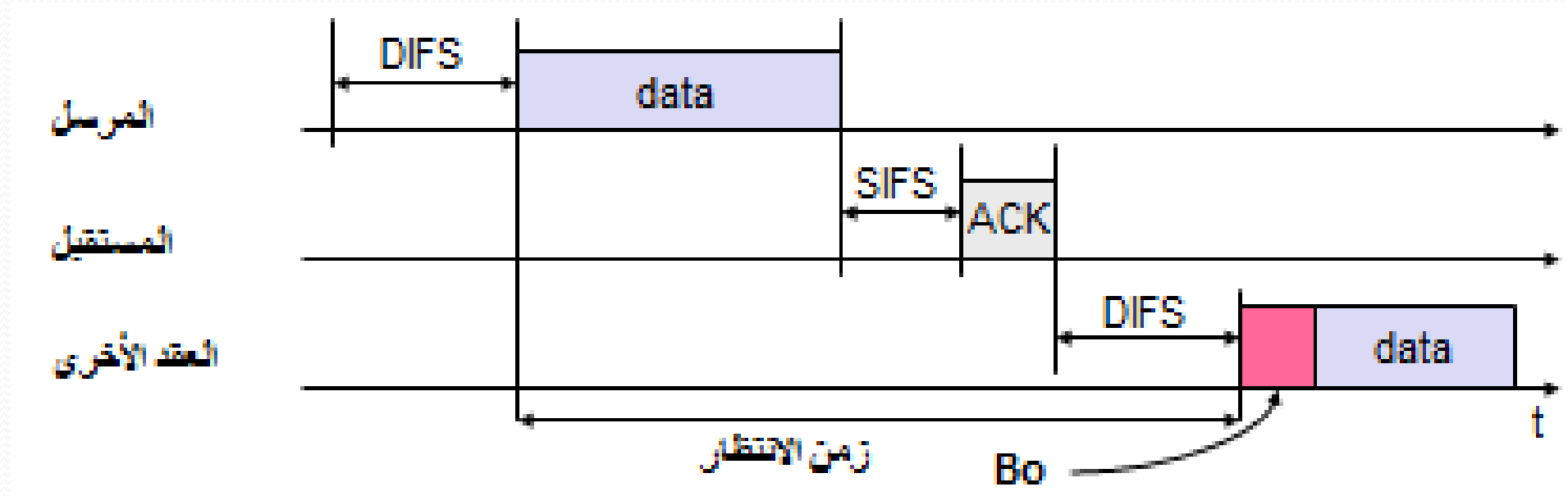
- Passive scanning
 - Becan (SSID,channel,datarate,TIM,timestampe,vendor information).
- Active scanning
 - Probe Request
 - Probe Response



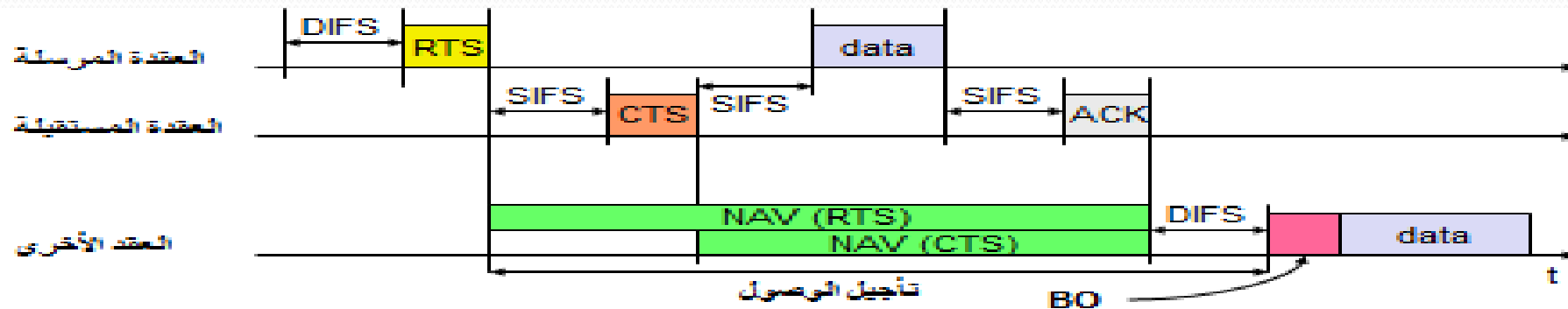
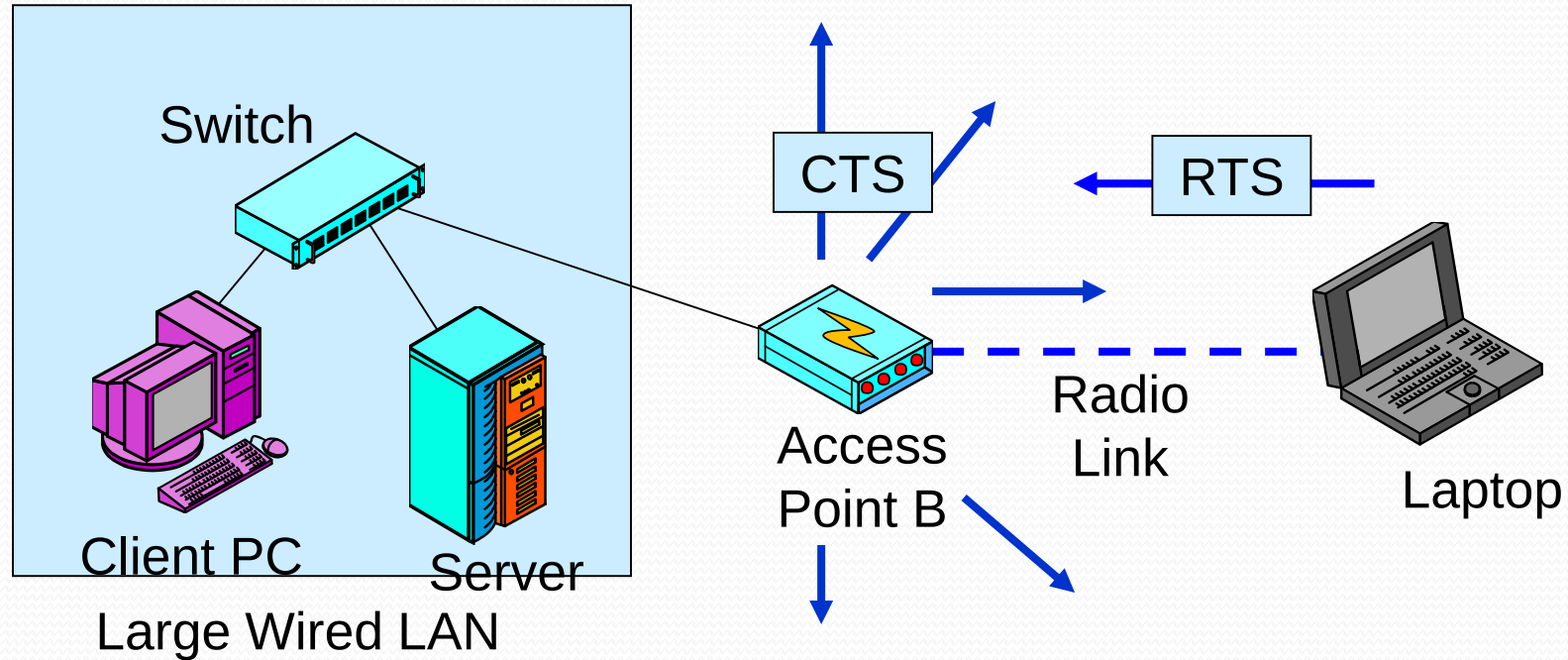
Accessing wlan....

- Wlan is half-duplex medium
- Use CSMA/CA
- DCF (distributed coordination function)
 - NAV
 - CCA
 - Back off time
 - transfer

DCF ...

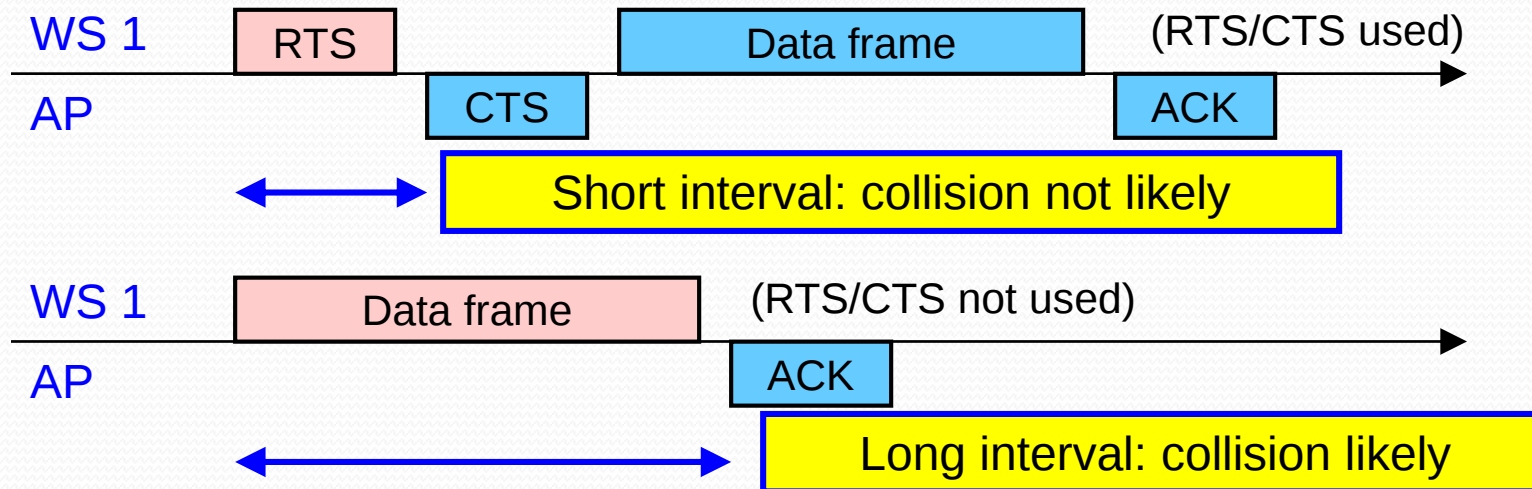


Request to Send/Clear to Send (RTS/CTS)



Request to Send/Clear to Send (RTS/CTS)

Usage of RTS/CTS offers an advantage if the data frame is very long compared to the RTS frame:



A long “collision danger” interval should be avoided for the following reasons:

- Larger probability of collision
- Greater waste of capacity if a collision occurs and the frame has to be retransmitted.

A threshold parameter (dot11RTSThreshold) can be set in the wireless station. Frames shorter than this value will be transmitted without using RTS/CTS.

802.11 standards

Standard	Year Released	Frequency (GHz)	Speed
802.11	1997	2.4	2 Mbps
802.11a	1999	5	1.5-54 Mbps
802.11b	1999	2.4	11 Mbps
802.11g	2003	2.4	54 Mbps
802.11n	2009	2.4/5	Up to 600 Mbps
802.11ac	2013	5	Up to 3.5 Gbps
802.11ax	2019	2.4/5	Up to 9.6 Gbps
802.11be	2024	2.4/5/6	Up to 46 Gbps

Wireless lan security

- Open system authentication
- WEP(shared-key authentication)
- WPA uses TKIP,RC₄
- WPA₂ uses CCMP,AES

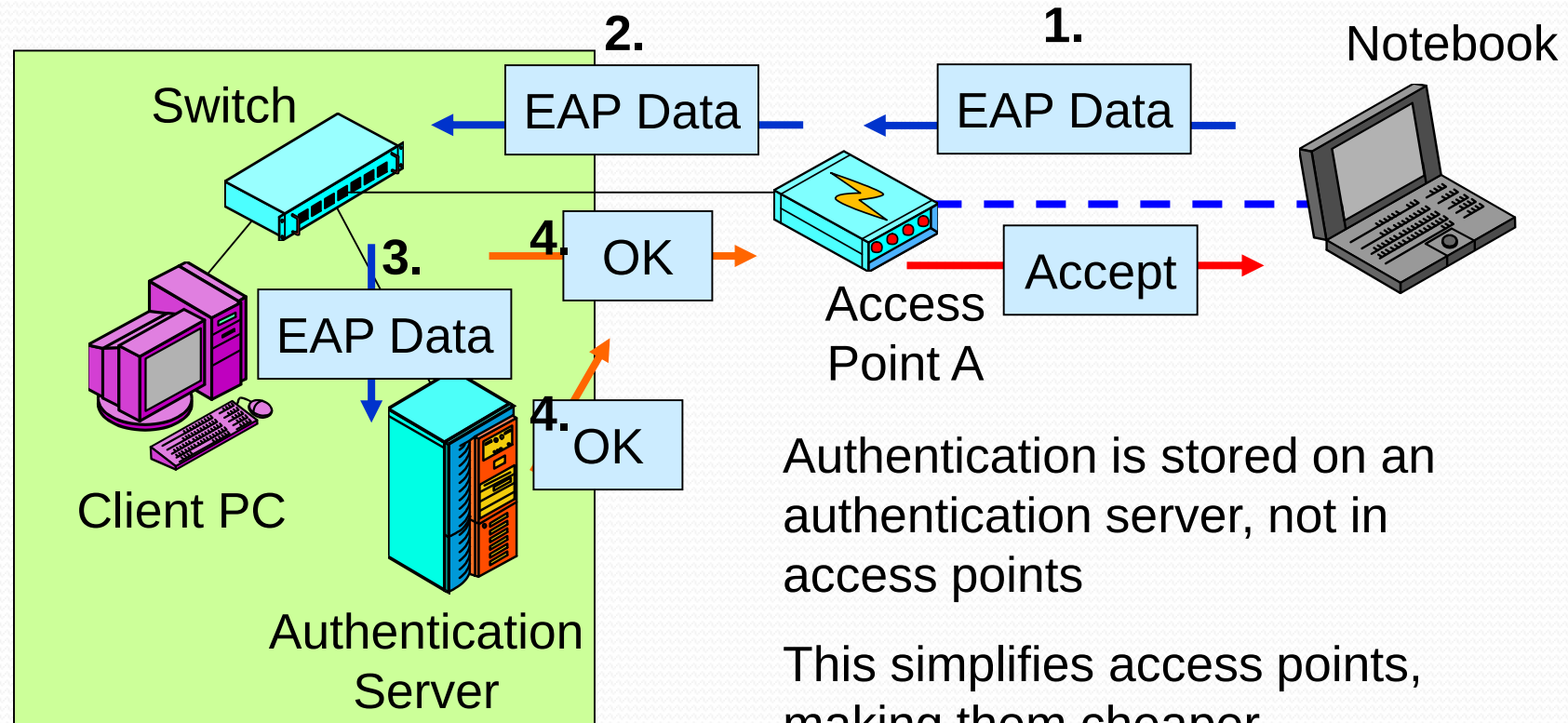


802.X EAPOL...

- EAP over LAN (EAPOL).
- Used for Authentication & Authorization.
- Uses Radius Protocol.
- Guests can be Isolated.



EAP- Extensible Authentication Protocol



Large Wired Ethernet LAN



Thank you,
Questions???